

CLAIMS

1. A photocatalyst module comprising a substrate, a photocatalyst, and a protective layer containing lithium silicate provided between the substrate and the photocatalyst.
- 5 2. The photocatalyst module according to claim 1 wherein said protective layer containing lithium silicate is a film obtained by applying a paint prepared from a vehicle containing 80 to 90 % by weight of lithium silicate and 10 to 20 % by weight of sodium silicate on the surface of said substrate.
- 10 3. The photocatalyst module according to claim 2 wherein said vehicle further contains 0.1 to 10 % by weight of a resin emulsion which is not gelatinized under an alkaline condition of a pH of 11 to 12.
- 15 4. The photocatalyst module according to any one of claims 1 to 3 wherein said photocatalyst is titanium oxide.
5. The photocatalyst module according to any one of claims 1 to 4 wherein said photocatalyst is in a shape of a layer of particles.
- 20 6. A process for producing a photocatalyst module having a layer of a photocatalyst on the surface thereof comprising forming a film containing lithium silicate on a substrate and then forming the layer of a photocatalyst on the surface of the film.
- 25 7. The process for producing a photocatalyst module according to claim 6 wherein said film containing lithium silicate is formed by applying a paint prepared from a

vehicle containing 80 to 90 % by weight of lithium silicate and 10 to 20 % by weight of sodium silicate on the surface of said substrate.

8. The process for producing a photocatalyst module
5 according to claim 7 wherein said vehicle further contains 0.1 to 10 % by weight of a resin emulsion which is not gelatinized under an alkaline condition of a pH of 11 to 12.

9. The process for producing a photocatalyst module
10 according to any one of claims 6 to 8 wherein the molar ratio of lithium oxide (Li_2O) to silicon dioxide (SiO_2) (lithium oxide : silicon dioxide) in the lithium silicate is 1:3.

10. The process for producing a photocatalyst module
according to any one of claims 6 to 9 wherein the formation
15 of said layer of a photocatalyst is carried out by a flame spray coating method.

11. A photocatalyst reaction apparatus provided with a photocatalyst module defined in any one of claims 1 to 5.

12. A photocatalyst reaction apparatus comprising a water
20 tank provided with a photocatalyst module defined in any one of claims 1 to 5, water introducing means, water discharging means, and means for radiating ultraviolet rays.

13. A photocatalyst reaction apparatus comprising a water tank on at least a part of the inner wall surface of which
25 tank a photocatalyst is provided through a protective layer containing lithium silicate, the water tank further having means for introducing water to be treated, means for

discharging the treated water, and means for radiating ultraviolet rays each provided at or in the water tank.

14. The photocatalyst reaction apparatus according to
claim 13 wherein said apparatus comprises at least two water
5 tanks connected in series, the means for radiating
ultraviolet rays provided in a first water tank is means for
radiating ultraviolet rays of a medium wavelength of 170 to
260 nm, and the means for radiating ultraviolet rays provided
in a second water tank is means for radiating ultraviolet
0 rays of a long wavelength of 310 to 370 nm.

15. The photocatalyst reaction apparatus according to
claim 14 wherein said apparatus further comprises a tank used
for mixing ozone formed by radiating ultraviolet rays of a
short wavelength of 183 to 184 nm to air with water to be
15 treated and placed at a position preceding said first water
tank in the order of treatments.